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LOCK

ABSTRACT OF THE DISCLOSURE

5

The structure of a lock, (10) wherein, a plurality of receiving holes (22) and alignment holes (23) are provided in and by the central keyhole (21) of a lock core (20) to receive therein a plurality of juxtaposing and integrally connected pushing pins (25) and alignment pins (26). The lock core (20) has on the surface thereof a longitudinal slit (24) in communication with the alignment holes (23) and for receiving an engaging strip (27).
10 An engaging groove (31) is provided on the inner wall of a cylinder (30), mating with the engaging strip (27) for movably receiving the latter. The pushing pins (25) and alignment pins (26) are integrally and parallelly connected in pairs, each pushing pin (25) is provided on the bottom thereof with a recess to receive a spring (252). The alignment
15 pins (26) have on the shanks thereof engaging holes (261) located in different levels. When a key (40) enters the keyhole (21) to displace the pushing pins (25) and alignment pins (26), the engaging hole (261) in each alignment pin (26) is aligned respectively with the longitudinal split (24) on the lock core (20) to insert the engaging strip (27) into a long groove formed from the aligned engaging holes (261), hence the lock core (20) can be
20 rotated in the cylinder for unlocking.



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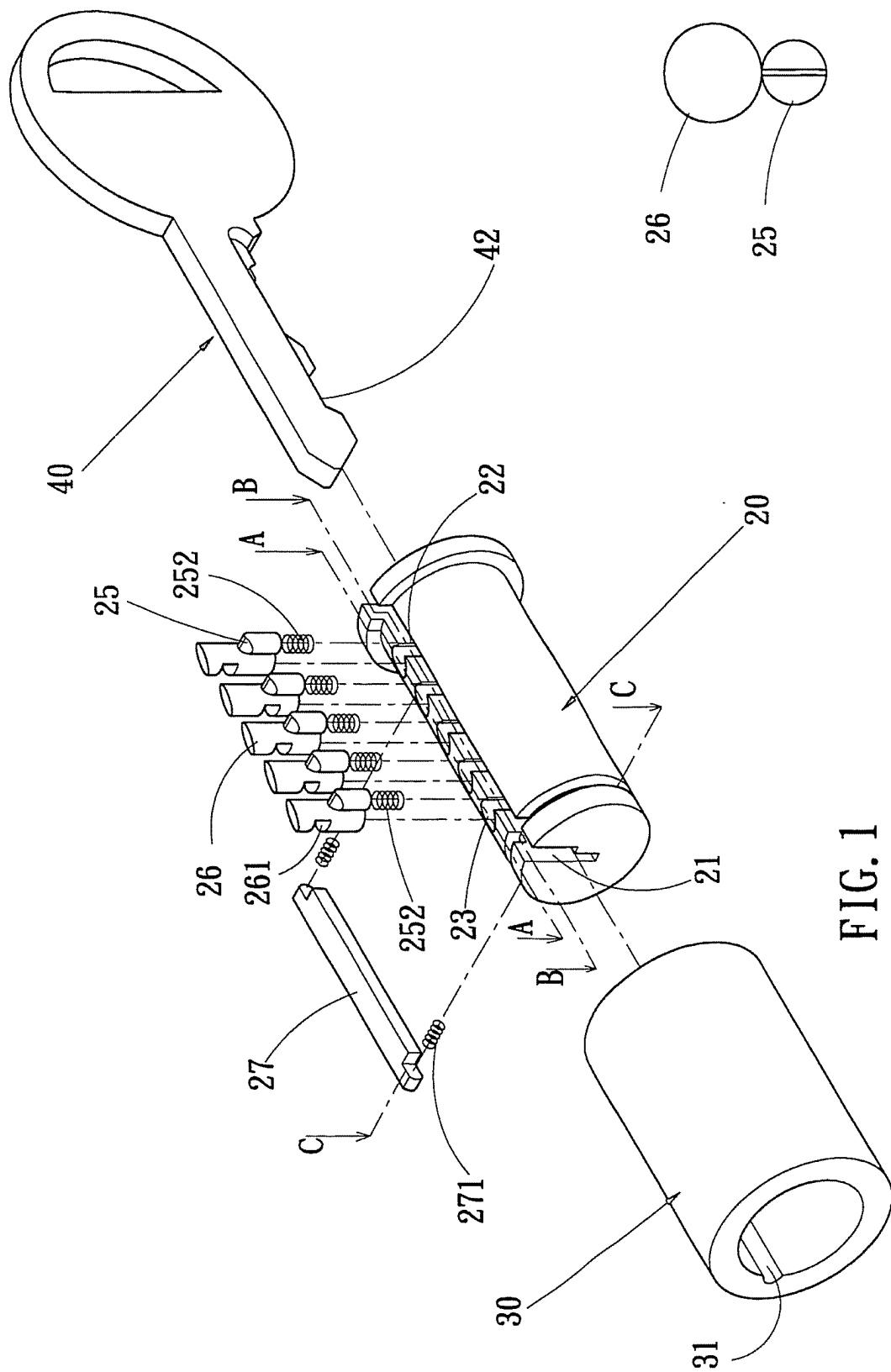


FIG. 1

FIG. 1A

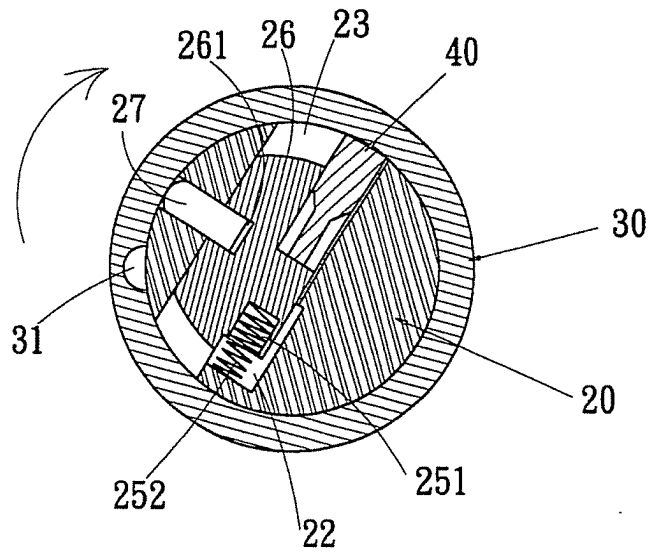


FIG. 9

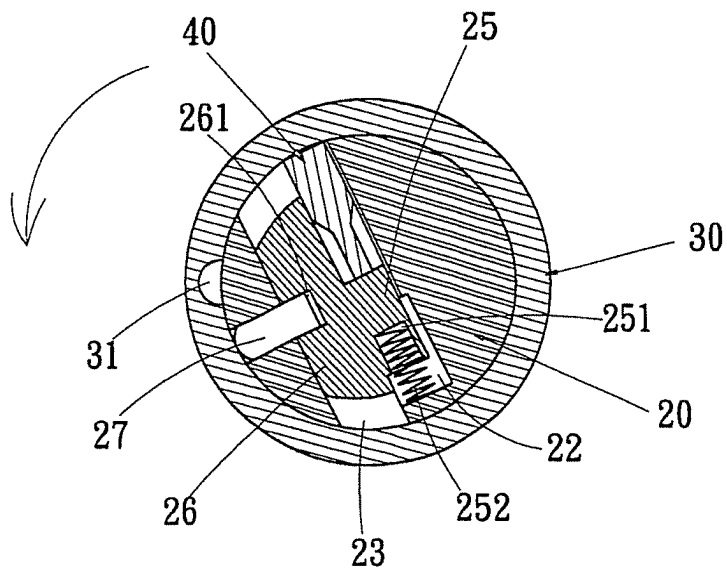
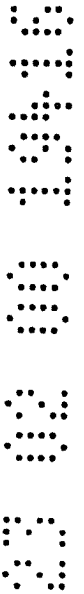


FIG. 10



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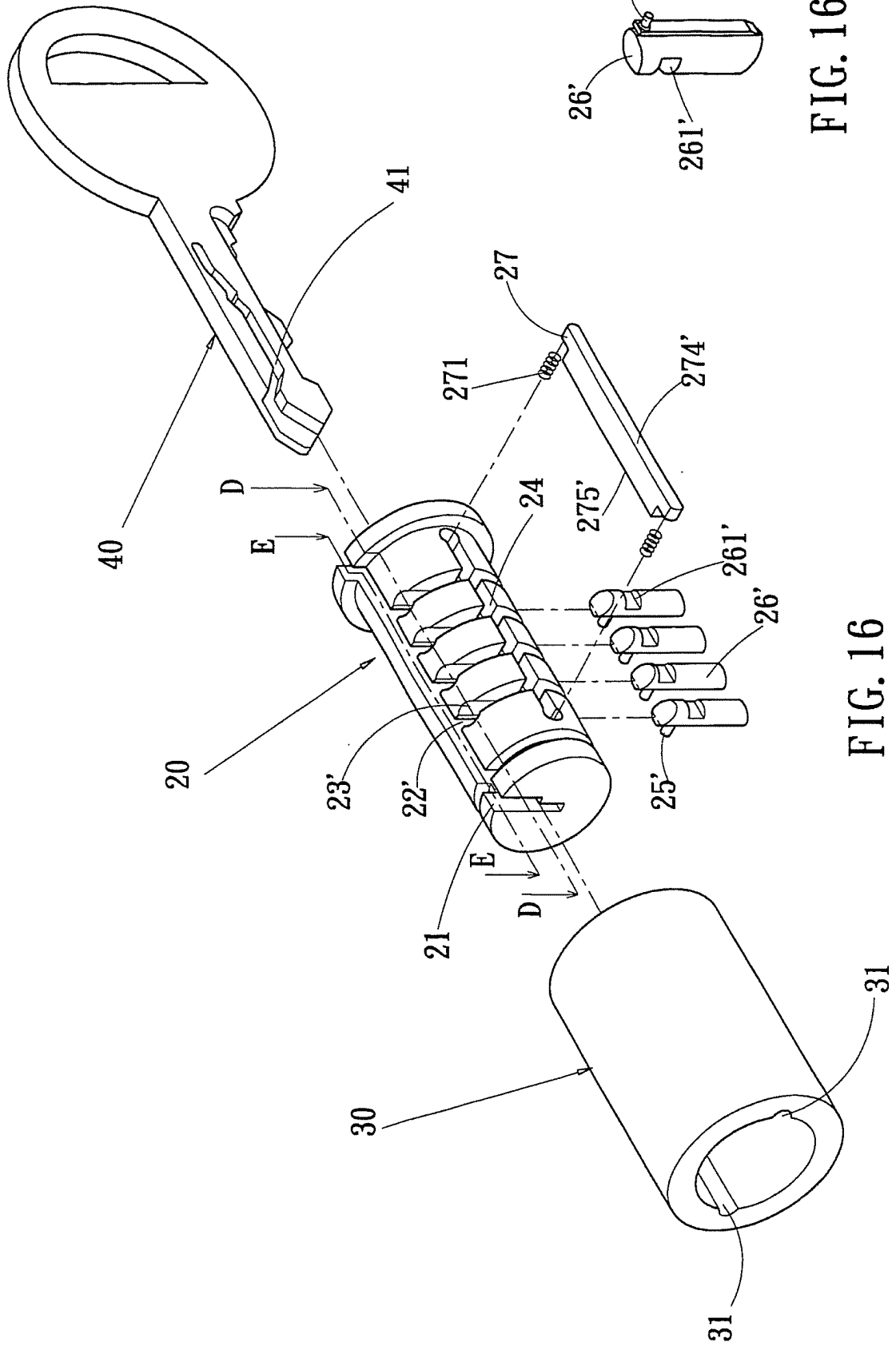


FIG. 16A

FIG. 16

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COMPLETE SPECIFICATION

FOR A STANDARD PATENT

ORIGINAL

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The following statement is a full description of this invention, including the best method of performing it known to me/us:-

TITLE: LOCK

BACKGROUND OF THE INVENTION

1. Field of the invention

The present invention is related to a lock, and especially to a
5 structure of lock wherein a plurality of receiving holes and alignment
holes are provided in and by the central keyhole of a lock core to receive
therein a plurality of juxtaposing and integrally connected pushing pins
and alignment pins. When a key enters the keyhole to displace the pushing
pins and alignment pins, an engaging hole in each alignment pin is
10 aligned respectively with a longitudinal slit on the lock core to allow
insertion of an engaging strip in the longitudinal slit into the aligned
engaging holes, hence the lock core can be rotated in the cylinder for
unlocking.

2. Description of the Prior Art

15 Locks are widely used at the locations or spots wherein guard against,
prevention from and limitation to access of things are required. Thereby,
a limited area can avoid being intruded or destroyed. Locks are very
important to the functions of protection and guard. Hence people have
many chances to use locks in their life, and locks always keep their
20 important position.

The most necessary structures in locks are the structures of lock
cores, cylinders, locking beards, locking pins or bolts. The most widely
used locks nowadays have juxtaposing locking pins, wherein the locking
pins are vertical ones. With the design of such kind of locks, there
25 must be larger spaces to receive locking pins, and the cylinders will
have protruding square portions to receive the locking pins. These

render the production quite troublesome, and make mounting of locks by locksmiths quite difficult. Abutment between locking pins may induce friction action and renders the locking pins worn, thereby, inconvenience in opening and locking the locks may be increased.

5 And more, very large portions of the locking pins are exposed to the keyholes of lock cores, keys extending into the keyholes may collide the locking pins to make them deviated or tilted, and damage the locks indirectly, this also adversely influence opening and locking of the locks.

10 SUMMARY OF THE INVENTION

In view that locks are very important tools for locking, and using of locks intimately relates to safety and guard of articles to be locked, the inventor of the present invention develops the novel lock structure of the present invention for locking, which structure is a design using
15 juxtaposing locking pins cooperating with engaging function of an engaging strip.

The present invention has a main object to have juxtaposing and integrally connected pushing pins and alignment pins received in the central keyhole of a lock core, and to insert an engaging strip into
20 a plurality of aligned engaging holes of the alignment pins after the engaging holes in the alignment pins are moved to align with a longitudinal slit on the lock core, hence the lock core can be rotated in a cylinder for unlocking.

The present invention has a secondary object to have the pushing
25 pins and alignment pins limited by the receiving holes and alignment holes provided in the a lock core, thereby, the pushing pins and

alignment pins are correctly positioned and not deviated.

The third object of the present invention is to make the positions of the engaging holes on the alignment pins untidy, and the engaging holes can only get tidy after they are all moved to correct positions
5 to allow the engaging strip to enter them, this can effectively prevent an external force from undue damaging.

The fourth object of the present invention is to make the pushing pins and alignment pins be parallelly connected in juxtaposition relationship in the lock core; this can strengthen the structure of the
10 pins.

The fifth object of the present invention is to make the pushing pins and alignment pins be integrally combined mutually or connected with a connecting plate, thereby, a plane surface is formed between the pushing pins and alignment pins.

The sixth object of the present invention is to make each alignment pin a straight board to be parallelly connected in juxtaposition relationship with a corresponding pushing pin.
15

The seventh object of the present invention is to provide all the pins and the engaging strip within the lock core; thereby, the cylinder
20 of the lock does not require further space to receive the pins.

The eight object of the present invention is to make the engaging ends of the engaging strip in the form of a straight board engage directly in a groove provided on the cylinder; thereby, engaging effect is good.

The ninth object of the present invention is to provide the pushing
25 pins in the shape of rods provided transversely on the upper portion of the alignment pins, the rod shaped pushing pins extend into a guiding

way of a key, the guiding way pushes and displaces the alignment pins to suitable positions to make the engaging holes on the alignment pins be aligned with the longitudinal slit on the lock core; thereby the engaging strip engages in the engaging holes to allow the lock core to
5 rotate in the cylinder.

The tenth object of the present invention is to provide the alignment pins each with a protruding portion on the lower portion thereof, an engaging rod and a coil spring are provided on the protruding portion to return the alignment pins to their original positions when they are
10 displaced.

The eleventh object of the present invention is to provide recesses on the bottoms of the protruding portions of the alignment pins to receive springs; the alignment pins can return to their original positions when they are displaced.

The present invention will be apparent in its objects and specific structures after reading the detailed description of the preferred embodiment thereof in reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is an analytic view showing a structure of the present
20 invention;

Fig. 1A is a schematic view showing the pushing pins and alignment pins of the present invention in juxtaposing state;

Fig. 2 is a sectional view of the lock core of the present invention;

Fig. 3 is another sectional view of the lock core of the present
25 invention;

Fig. 4 is a side view showing the structure of the lock core of the

present invention;

Fig. 5 is a sectional view showing the structure of the lock of the present invention;

Fig. 6 is a schematic view showing a key is inserted into the lock core to move the pushing pins of the present invention in juxtaposing state;

Fig. 7 is another schematic view showing a key is inserted into the lock core to move the pushing pins of the present invention in juxtaposing state;

Fig. 8 is a schematic view showing a key is inserted into the lock core to align the alignment pins with a longitudinal slit on the lock core of the present invention;

Fig. 9 is a schematic view showing clockwise rotation of the lock core of the present invention;

Fig. 10 is a schematic view showing counterclockwise rotation of the lock core of the present invention;

Fig. 11 is another sectional view showing the structure of the lock of the present invention;

Fig. 12 is a schematic view showing the second embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 12A is a top view showing the pushing pins and alignment pins in pairs as those of Fig. 12 of the present invention;

Fig. 13 is a schematic view showing the third embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 13A is a top view showing the structure of the pushing pins and alignment pins in pairs as those of Fig. 13 of the present invention;

Fig. 14 is a schematic view showing the fourth embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 14A is a partial sectional view of the engaging strip of Fig. 14;

5 Fig. 15 is a schematic view showing the fifth embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 15A is a partial sectional view of the engaging strip of Fig. 15;

Fig. 16 is a schematic view showing the sixth embodiment of pushing
10 pins and alignment pins in pairs of the present invention;

Fig. 16A is a top view showing the structure of the pushing pins and alignment pins in pairs as those of Fig. 16 of the present invention;

Fig. 17 is a sectional view showing the structure of the lock core of Fig. 16;

15 Fig. 18 is another sectional view showing the structure of the lock core of Fig. 16;

Fig. 19 is a schematic view showing the positions of the lock core and the alignment pins of Fig. 16;

20 Fig. 20 is a sectional view showing a key is inserted into the lock core of Fig. 16;

Fig. 21 is another sectional view showing a key is inserted into the lock core of Fig. 16;

Fig. 22 is a schematic view showing a key is inserted into the lock core of Fig. 16;

25 Fig. 23 is a sectional view showing the structure of the lock of Fig. 16;

Fig. 24 is another sectional view showing the structure of the lock of Fig. 16;

Fig. 25 is a schematic view showing the seventh embodiment of pushing pins and alignment pins in pairs of the present invention;

5 Fig. 25A is a top view showing the structure of the pushing pins and alignment pins in pairs as those of Fig. 25 of the present invention;

Fig. 26 is a sectional view showing the structure of Fig. 25;

Fig. 27 is another sectional view showing the structure of Fig. 25;

Fig. 28 is a schematic view showing the eighth embodiment of pushing
10 pins and alignment pins in pairs of the present invention;

Fig. 28A is a top view showing the structure of the pushing pins and alignment pins in pairs as those of Fig. 28 of the present invention;

Fig. 29 is a sectional view showing the structure of Fig. 28;

Fig. 30 is another sectional view showing the structure of Fig. 28;

15 Fig. 31 is a schematic view showing the ninth embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 32 is a sectional view showing the structure of Fig. 31;

Fig. 33 is another sectional view showing the structure of Fig. 31;

Fig. 34 is a third sectional view showing the structure of Fig. 31;

20 Fig. 35 is a fourth sectional view showing the structure of Fig. 31;

Fig. 36 is a fifth sectional view showing the structure of Fig. 31;

Fig. 37 is a schematic view showing the tenth embodiment of pushing pins and alignment pins in pairs of the present invention;

25 Fig. 38 is a schematic view showing the eleventh embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 39 is a schematic view showing the twelfth embodiment of pushing pins and alignment pins in pairs of the present invention;

Fig. 40 is a side view showing the structure of the lock core of Fig. 39.

5 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring to Fig. 1, the lock 10 of the present invention is comprised of a lock core 20, a plurality of pushing pins 25 and alignment pins 26, an engaging strip 27 and a cylinder 30.

10 In the lock core 20: a plurality of receiving holes 22 and alignment holes 23 are provided in and by the central keyhole 21 of the lock core 20. The lock core 20 has on the surface thereof a longitudinal slit 24 of which the bottom is in communication with the alignment holes 23 (as shown in Fig. 3 and 4).

15 The engaging strip 27 (as shown in Fig. 1 and 5): is elongate and received in the longitudinal slit 24 of the lock core 20; both ends of the engaging strip 27 are elastically supported at the bottoms thereof by a spring 271 to render the top 274 of the engaging strip 27 exposed to the outside of the lock core 20.

20 The cylinder 30: is slipping over the lock core 20, the inner wall thereof is provided with an engaging groove 31 mating with the engaging strip 27 for embedding of the top 274 of the engaging strip 27.

The alignment pins 26: are received in the alignment holes 23, the alignment pins 26 have on the shanks thereof engaging holes 261 located in different levels;

25 The pushing pins 25: are integrally and parallelly connected with the alignment pins 26 (as shown in Fig. 1A and 34A) and are received

in the receiving holes 22 of the lock core 20, and further are elastically supported by a plurality of second springs 252 respectively to render the alignment pins 26 and the engaging holes 261 thereof located in different levels (as shown in Fig. 3 and 4).

5 When a key 40 enters the central keyhole 21 of the lock core 20 (as shown in Fig. 1 and 6), it abuts the tops of the pushing pins 25 with its alignment serration 42 to move the alignment pins 26 and to align the engaging holes 261 (as shown in Fig. 7 and 8) with the longitudinal slit 24 of the lock core 20. When the lock core 20 is rotated with the
10 key 40 (as shown in Fig. 8 and 9), the bottom portions 275 of the engaging strip 27 can be embedded in a long groove formed from the aligned engaging holes 261 to thereby release the top 274 of the engaging strip 27 in the longitudinal slit 24 of the lock core 20 from engagement of the engaging groove 31 in the cylinder 30 for unlocking. Hence the lock core
15 20 can be rotated clockwise (as shown in Fig. 9) or counterclockwise (as shown in Fig. 10) in the cylinder 30.

The lock core 20 can push the engaging strip 27 when in rotating, so that the arciform top 274 of the engaging strip 27 will be pressed to move along the curvature of the engaging groove 31 toward the interior
20 of the lock core 20. The bottom portions 275 of the engaging strip 27 can be moved gradually into the aligned engaging holes 261 of the alignment pins 26 to be completely released from engagement of the engaging groove 31 of the cylinder 30. When it is to get a locking state, the longitudinal slit 24 of the lock core 20 is rotated back to align
25 with the engaging groove 31 of the cylinder 30, then the engaging strip 27 in the longitudinal slit 24 is pushed by the spring 271 (as shown

in Fig. 10) to have the top 274 of the engaging strip 27 engaged again in the engaging groove 31. Thereby, the lock core 20 cannot be rotated in the cylinder 30, and locking state is obtained.

Referring to Fig. 12 and 12A, these drawings show the second embodiment of the pushing pins 25 and alignment pins 26 in pairs of the present invention, wherein, each pair of a pushing pin 25 and an alignment pin 26 are connected with a connecting plate 29. The receiving holes 22 and alignment holes 23 of the lock core 20 have the shape coincident with that of the pairs of the pushing pins 25 and alignment pins 26 (as shown in Fig. 34B). The alignment pins 26 can be in the shape of straight boards connecting in juxtaposing relationship to the corresponding pushing pins 25 (as shown in the embodiment of Fig. 13 and 13A), and the receiving holes 22 and alignment holes 23 of the lock core 20 are also in the shape same as the corresponding pushing pins 25 (as shown in Fig. 34C).

Referring to Fig. 14 and 14A show the fourth embodiment of the pushing pins 25 and alignment pins 26 in pairs and the engaging strip 27 of the present invention, wherein, the engaging holes 261 on the surfaces of the alignment pins 26 juxtaposing the pushing pins 25 each can be in a round shape. The engaging strip 27 is provided with round rods 272 to be engaged in the round engaging holes 261 of the alignment pins 26. Referring to Fig. 15 and 15A showing the fifth embodiment of the pushing pins 25 and alignment pins 26 in pairs and the engaging strip 27 of the present invention, wherein, the engaging strip 27 is provided with an engaging plate portion 273 mating with in the alignment pins 26, the engaging plate portion 273 is adapted to engaging in the engaging

holes 261 of the alignment pins 26.

Referring to Fig. 16 and 16A which show the sixth embodiment of the pushing pins and alignment pins in pairs of the present invention, wherein, the pushing pins 25' are in the shape of rods provided transversely on the upper portion of the alignment pins 26'. A key 40 is provided at the position corresponding to the rod shaped pushing pins 25' with a guiding way 41. When the pushing pins 25' and alignment pins 26' are placed in the receiving holes 22' and alignment holes 23' of the lock core 20 to combine with the cylinder 30 (as shown in Fig. 23), the alignment pins 26' are located at the junctions between the alignment holes 23' of the lock core 20 and the cylinder 30 (as shown in Fig. 17 and 18) with the engaging holes 261' of the alignment pins 26' at different levels relative to the longitudinal slit 24 of the lock core 20 (as shown in Fig. 19).

When a key 40 is inserted into the central keyhole 21 of the lock core 20 (as shown in Fig. 20), the guiding way 41 of the key 40 guides the pushing pins 25' in the shape of rods to displace the pushing pins 25' along with the alignment pins 26' (as shown in Fig. 21), to align the engaging holes 261' of the alignment pins 26' with a longitudinal slit 24' of the lock core 20 (as shown in Fig. 22). When the lock core 20 is rotated with the key 40 (as shown in Fig. 23 and 24), the engaging strip 27' in the longitudinal slit 24' is pressed to rotate along the engaging groove 31 and moved inwardly to engage the bottom portions 275' of the engaging strip 27' into the aligned engaging holes 261' of the alignment pins 26' to allow the lock core 20 to rotate in the cylinder 30 as is an unlock state.

When the pushing pins 25' are provided transversely on the upper portion of the alignment pins 26', the alignment pins 26' are provided on the lower portions thereof each with a protruding portion 28 (as shown in Fig. 25 and 25A), the protruding portion 28 is provided on the bottom thereof with a recess 284, a coil spring 285 is received in the recess 284. When the alignment pins 26' are placed in the alignment holes 23 of the lock core 20 (as shown in Fig. 26) to combine with the cylinder 30, the alignment pins 26' are pushed by the corresponding coil springs 285 to render the aligned engaging holes 261' of the alignment pins 26' to be separated from the longitudinal slit 24' of the lock core 20. When a key 40 is inserted into the central keyhole 21 of the lock core 20 (as shown in Fig. 27), the guiding way 41 of the key 40 presses the pushing pins 25' downwardly, and also presses down the alignment pins 26' to align the engaging holes 261' of the alignment pins 26' with a longitudinal slit 24' of the lock core 20. When the lock core 20 is rotated, the engaging strip 27' is pressed during rotation of the lock core 20 and is moved inwardly along the curvature of the engaging groove 31 of the cylinder 30 and is engaged in the engaging holes 261' of the alignment pins 26' to get the unlock state.

As shown in Fig. 28 and 28A, when the pushing pins 25' are provided transversely on the upper portion of the alignment pins 26', the alignment pins 26' are provided on the lower portions thereof each with a protruding portion 28. The protruding portion 28 is provided on the bottom thereof with a through hole 281 for engagement therein an engaging rod 282 having a coil spring 283 slipped thereover to place altogether a corresponding alignment pin 26', a corresponding pushing pin 25' in

the shape of a rod and the engaging rod 282 into a corresponding receiving hole 22 and a corresponding alignment hole 23 of the lock core 20 (as shown in Fig. 29). And all the members are place in the cylinder 30. When a key 40 is inserted into the central keyhole 21 of the lock core 20 (as shown in Fig. 30), the guiding way 41 of the key 40 pushes the alignment pins 26', the coil spring 283 in the protruding portion 28 on the upper portion of the alignment pins 26' below the corresponding pushing pin 25' is compressed. While the corresponding engaging hole 261' on the surface of the alignment pin 26' is moved to align with a longitudinal slit 24 of the lock core 20. When the lock core 20 is rotated, the engaging strip 27 in the longitudinal slit 24 is pressed during rotation of the lock core 20 and is moved inwardly along the curvature of the engaging groove 31 of the cylinder 30 and is engaged with its bottom portion in the engaging holes 261' of the alignment pins 26' to get the unlock state.

Referring to Fig. 31, the lock core 20 is provided in and by the central keyhole 21 with two lines of receiving holes 22, 22' and alignment holes 23, 23' respectively receiving two lines of pushing pins 25, 25' and alignment pins 26, 26'. Wherein, one line of pushing pins 25 are juxtaposed and integrally connected with their corresponding line of alignment pins 26. When a key 40 is inserted into the central keyhole 21 of the lock core 20 (as shown in Fig. 32), the key 40 abuts the tops of the pushing pins 25 with its alignment serration 42; the other line of pushing pins 25' are in the shape of rods and are provided transversely on the upper portion of the alignment pins 26' (as shown in Fig. 31), and the key is provided with a guiding way 41 for cooperating with the

pushing pins 25'. When the key 40 is inserted into the central keyhole 21 of the lock core 20 (as shown in Fig. 32), the guiding way 41 of the key 40 pushes the alignment pins 26' upwardly. As shown in Fig. 31, the lock core 20 is provided with two longitudinal slits 24, 24' in
5 corresponding to the two lines of engaging holes 261, 261' on the surfaces of the alignment pins 26, 26'. The two longitudinal slits 24, 24' are placed therein each with an engaging strip 27 (27') abutting a coil spring 271 with the end thereof. The tops 274, 274' of the engaging strips 27, 27' are exposed to the outside of the lock core 20 and engaged
10 respectively in two engaging grooves 31, 31' of the cylinder 30 (as shown in Fig. 34, 35).

As shown in Fig. 32, 33, after the key 40 is inserted into the central keyhole 21 of the lock core 20, the key 40 abuts the tops of the pushing pins 25 with its alignment serration 42; the guiding way 41 of the key
15 40 is provided for insertion of the other line of pushing pins 25' in the shape of rods. That is, the key 40 simultaneously moves the two lines of pushing pins 25, 25' and alignment pins 26, 26' to align the engaging hole 261, 261' of the alignment pin 26, 26' respectively with the two longitudinal slits 24, 24' of the lock core 20. When the lock core 20
20 is rotated, the engaging strips 27, 27' in the two longitudinal slits 24, 24' are pressed by the lock core 20. Thereby the engaging strips 27, 27' are moved inwardly along the curvature of the engaging groove 31, 31' and are engaged with their bottom portions 275, 275' in the engaging holes 261, 261' of the alignment pins 26, 26' to allow the lock core 20
25 to rotate in the cylinder 30 as is an unlock state.

When the two longitudinal slits 24, 24' of the lock core 20 are

rotated back to align with the engaging grooves 31, 31', the key 40 can be taken out of the central keyhole 21 of the lock core 20, and the engaging strips 27, 27' in the two longitudinal slits 24, 24' are pushed by the respectively by the two coil springs 271 (as shown in Fig. 36),
5 so that the tops of the engaging strips 27, 27' are engaged again in the engaging grooves 31, 31' of the cylinder 30 to form the locking state.

Referring to Fig. 37, the engaging holes 261, 261' on the surface of the two lines of alignment pins 26, 26' of the lock core 20 are round, two round rods 272, 272' are provided on the engaging strips 27, 27' and
10 can be engaged in the two lines of round engaging holes 261, 261' of the alignment pins 26, 26'.

Referring to Fig. 38, the engaging strips 27, 27' are provided respectively with two engaging plate portions 273, 273' adapted to engaging in the engaging holes 261, 261' of the two lines of alignment
15 pins 26, 26' by extending through the two longitudinal slits 24, 24' of the lock core 20.

Referring then to Fig. 39 and 40, the two lines of pushing pins 25, 25' and alignment pins 26, 26' in the lock core 20 can be of different shapes. For example, the pushing pins 25 are integrally and parallelly connected with the alignment pins 26 (as shown in (a) of Fig. 40); or each pair of a pushing pin 25 and an alignment pin 26 are connected with a connecting plate 29 (as shown in (b) of Fig. 40); or the alignment
20 pin 26 can be in the shape of a straight board to integrally connect with pushing pin 25 (as shown in (c) of Fig. 40); or each pushing pin 25' can be in the shape of a rod provided transversely on the upper portion of an alignment pin 26' (as shown in (d) of Fig. 40); or the alignment
25

pins 26' are provided on the lower portions thereof each with a protruding portion 28, the protruding portion 28 is provided on the bottom thereof with a recess 284, and a coil spring 285 is received in the recess 284 (as shown in (e) of Fig. 40); otherwise, the protruding portion 28 can be provided on the bottom thereof with a through hole 281 for engagement therein an engaging rod 282 having a coil spring 283 slipped thereover (as shown in (f) of Fig. 40). The pushing pins 25, 25' and alignment pins 26, 26' with different shapes can be received in the receiving holes 22, 22' and alignment holes 23, 23' respectively with corresponding shapes.

10 The present invention has novel integral and parallel connecting pins cooperated with the engaging strips and moved in the lock core, by engaging of the engaging strips with the engaging groove of the cylinder, locking action can be achieved. The design of integral and parallel connecting renders the cylinder to save the space required for receiving the pins, and saving of volume is obtained.

15 Having thus described the technical structure of my invention with practicability and novelty, therefore, what I claim as new and desire to be secured by Letters Patent of the United States are:

20

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~~CLAIMS~~ The claims defining the invention are as follows:

1. A lock comprising:

a lock core, being provided in and by the central keyhole thereof with a plurality of receiving holes and alignment holes, and provided
5 on the surface thereof with a longitudinal slit in communication with said alignment holes;

an engaging strip, being elongate and received in said longitudinal slit; both ends of said engaging strip being elastically supported by a spring to render said engaging strip exposed to the
10 outside of said lock core;

a cylinder, being slipping over said lock core, the inner wall thereof being provided with an engaging groove mating with said engaging strip for removably receiving said engaging strip;

a plurality of alignment pins, being received in said alignment
15 holes, said alignment pins having on the shanks thereof engaging holes located in different levels;

a plurality of pushing pins, being integrally and parallelly connected with said alignment pins and being received in said receiving
20 holes, and further being elastically supported by a plurality of second springs respectively to render said alignment pins and said engaging holes thereof located in different levels, a key entering said central keyhole pushing and displacing said pushing pins and alignment pins to tidily align said engaging holes, rotation of said lock core rendering
25 said engaging strip to insert into a long groove formed from said aligned engaging holes, hence said lock core can be rotated in said cylinder to release from engagement for unlocking.

2. A lock as claimed in claim 1, wherein,

said pushing pins each is provided on the bottom thereof with a recess to receive one of said second springs.

3. A lock as claimed in claim 1, wherein,

5 said engaging holes in said alignment pins are round holes, said engaging strip is provided on the bottom thereof with round rods mating with said round holes, said round rods are adapted thereby to engaging in said round engaging holes.

4. A lock as claimed in claim 1, wherein,

10 said engaging strip is provided on the bottom thereof with an engaging plate portion mating with said engaging holes in said alignment pins, said engaging plate portion is adapted to engaging in said engaging holes for unlocking said lock.

5. A lock as claimed in claim 1, wherein,

15 a key entering said central keyhole abuts the tops of said pushing pins with its alignment serration.

6. A lock as claimed in claim 1, wherein,

20 said pushing pins and said alignment pins are connected by means of a connecting plate therebetween, said receiving holes and alignment holes are in the shape in conformity with the cross-sectional shape of said pushing pins and said alignment pins together with said connecting plate therebetween.

7. A lock as claimed in claim 1, wherein,

25 said pushing pins are in the shape of rods and are provided transversely on the upper portion of said alignment pins, and said key is provided with a guiding way for cooperating with said pushing pins,

said key pushes and displaces said pushing pins in the shape of rods when it enters said central keyhole to move in said guiding way to move said alignment pins and unlock said lock.

8. A lock as claimed in claim 1, wherein,

5 said alignment pins are provided on the lower portions thereof each with a protruding portion having a through hole, an engaging rod is placed in said through hole and has a coil spring slipped thereover; said coil springs make returning of said alignment pins to their original positions.

10 9. A lock as claimed in claim 1, wherein,

 said lock core is provided thereon with two lines of receiving holes and alignment holes to receive therein two lines of pushing pins and alignment pins, wherein, one line of said pushing pins and alignment pins are integrally and parallelly connected in pairs, a key abuts the
15 tops of said pushing pins with its alignment serration when it enters said central keyhole; the other line of said pushing pins are in the shape of rods and are provided transversely on the upper portion of said alignment pins, and said key is provided with a guiding way for cooperating with said pushing pins.

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10. A lock substantially as hereinbefore described with reference to Figs. 1 to 11; Figs. 12 and 12a; Figs. 13 and 13a; Figs. 14 and 14a; Figs. 15 and 15a; Figs. 16 to 24; Figs. 25 to 27; Figs. 28 to 30; Figs. 31 to 36; Fig. 37; Fig. 38; or Figs. 39 and 40 of the accompanying drawings.

Dated 22 February, 2000

Lok Kam Lam

Patent Attorneys for the Applicant/Nominated Person

SPRUSON & FERGUSON



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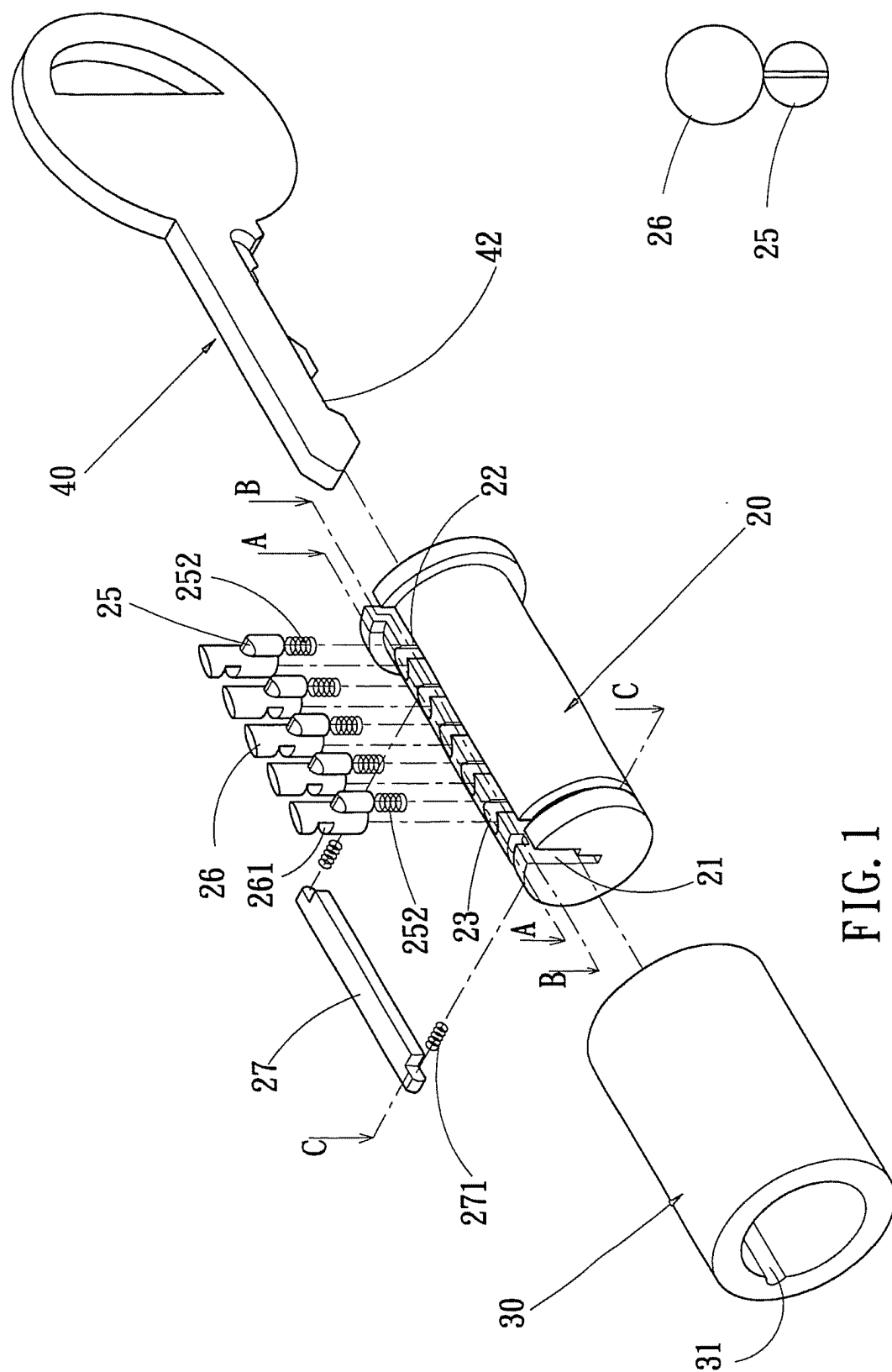
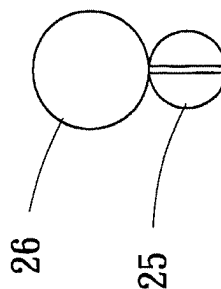
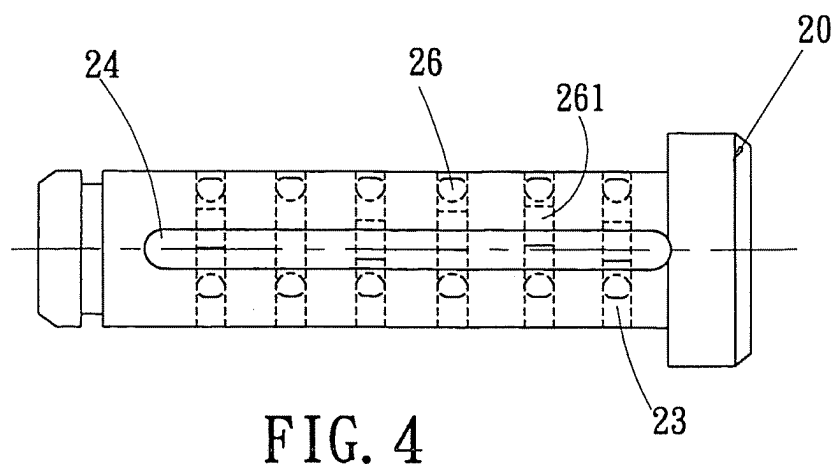
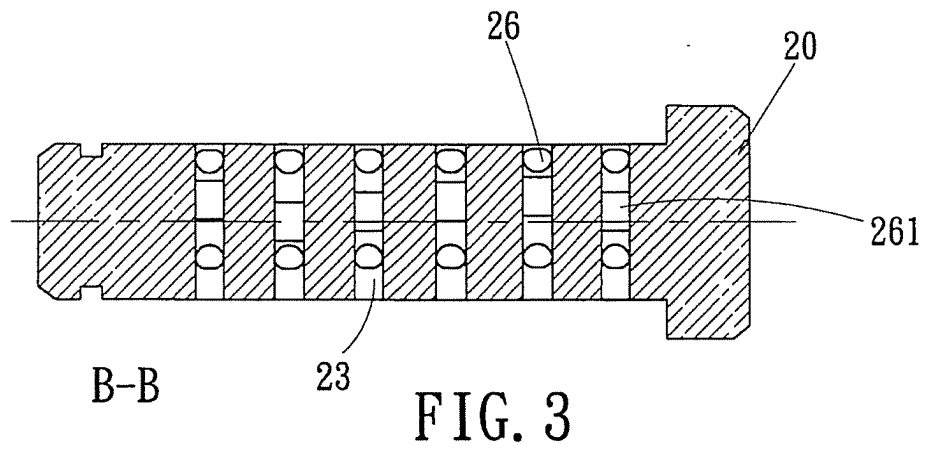
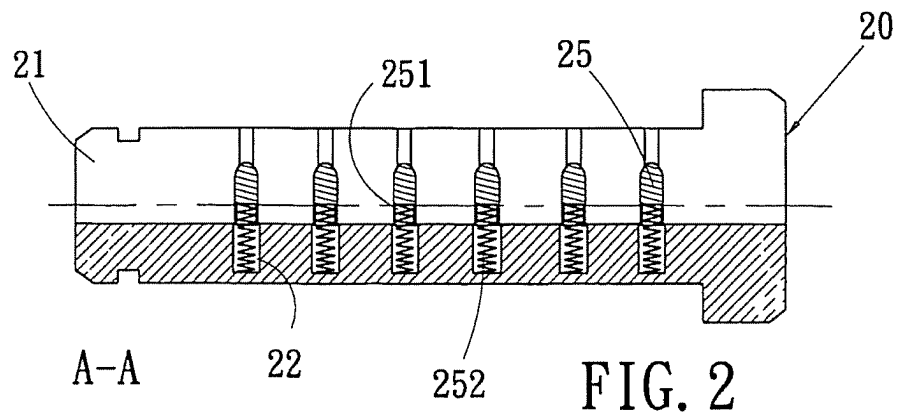


FIG. 1A





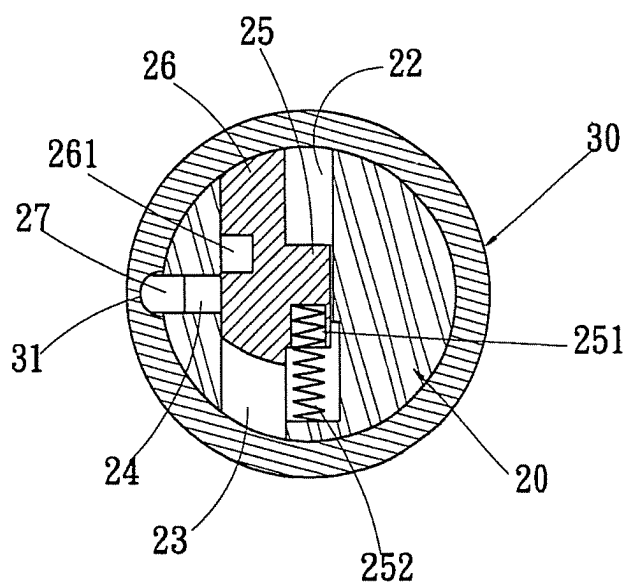
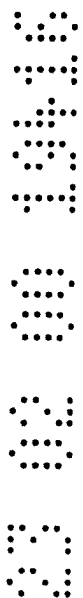
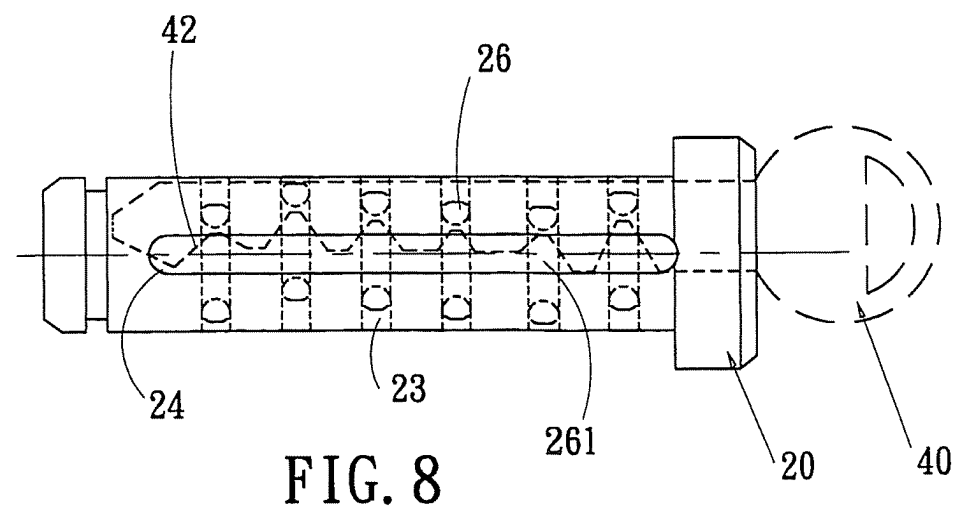
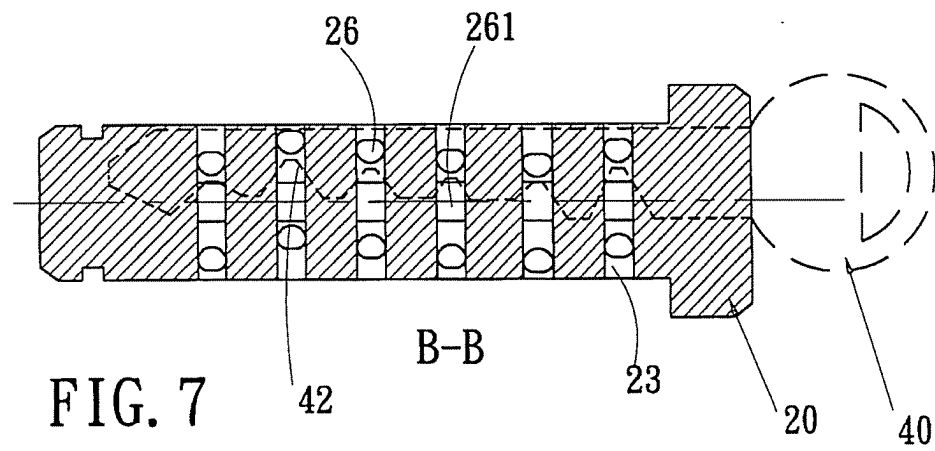
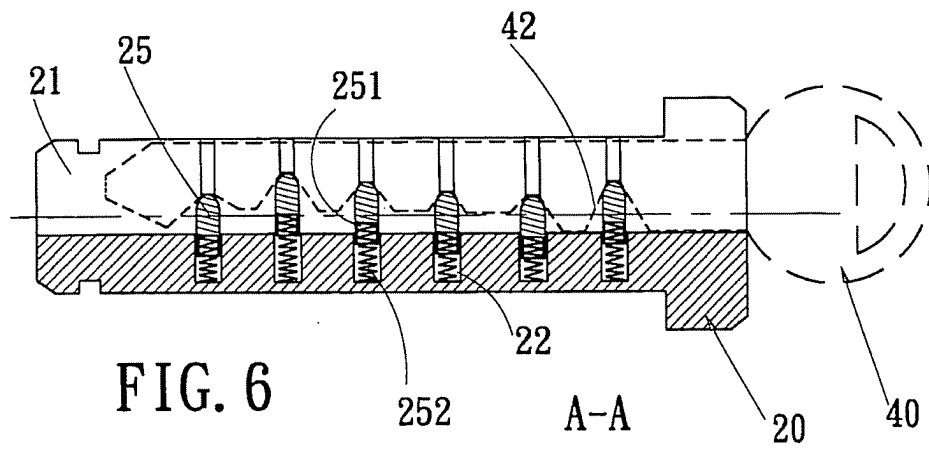


FIG. 5





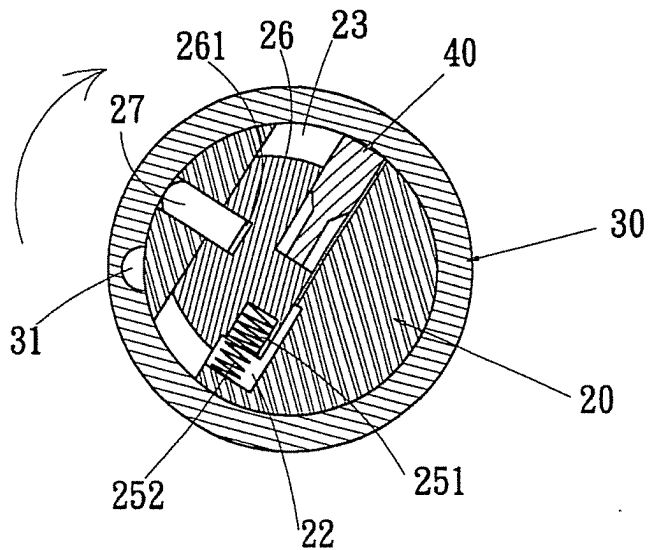


FIG. 9

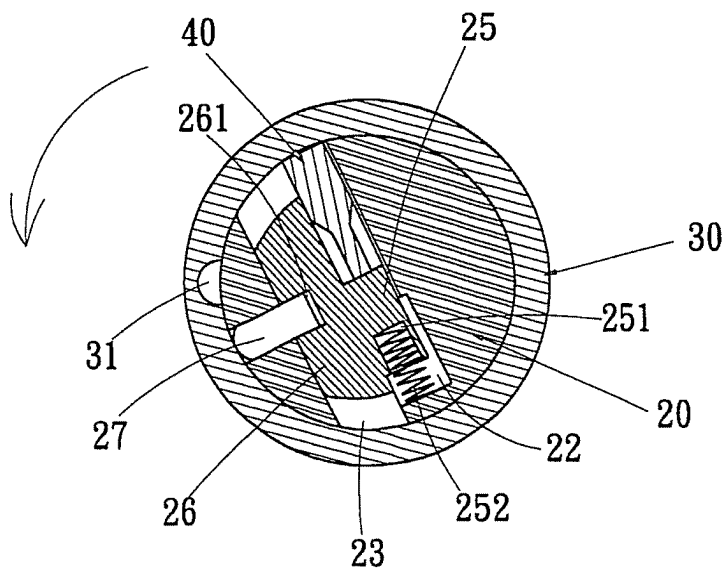
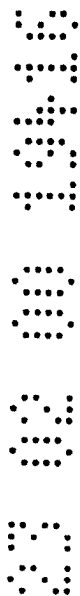
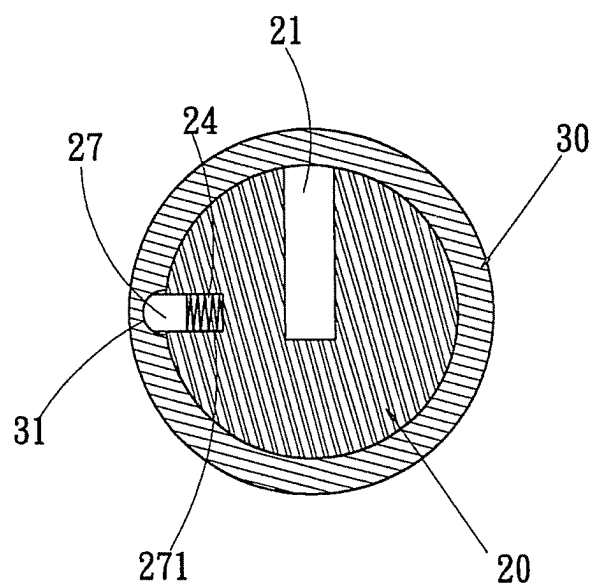


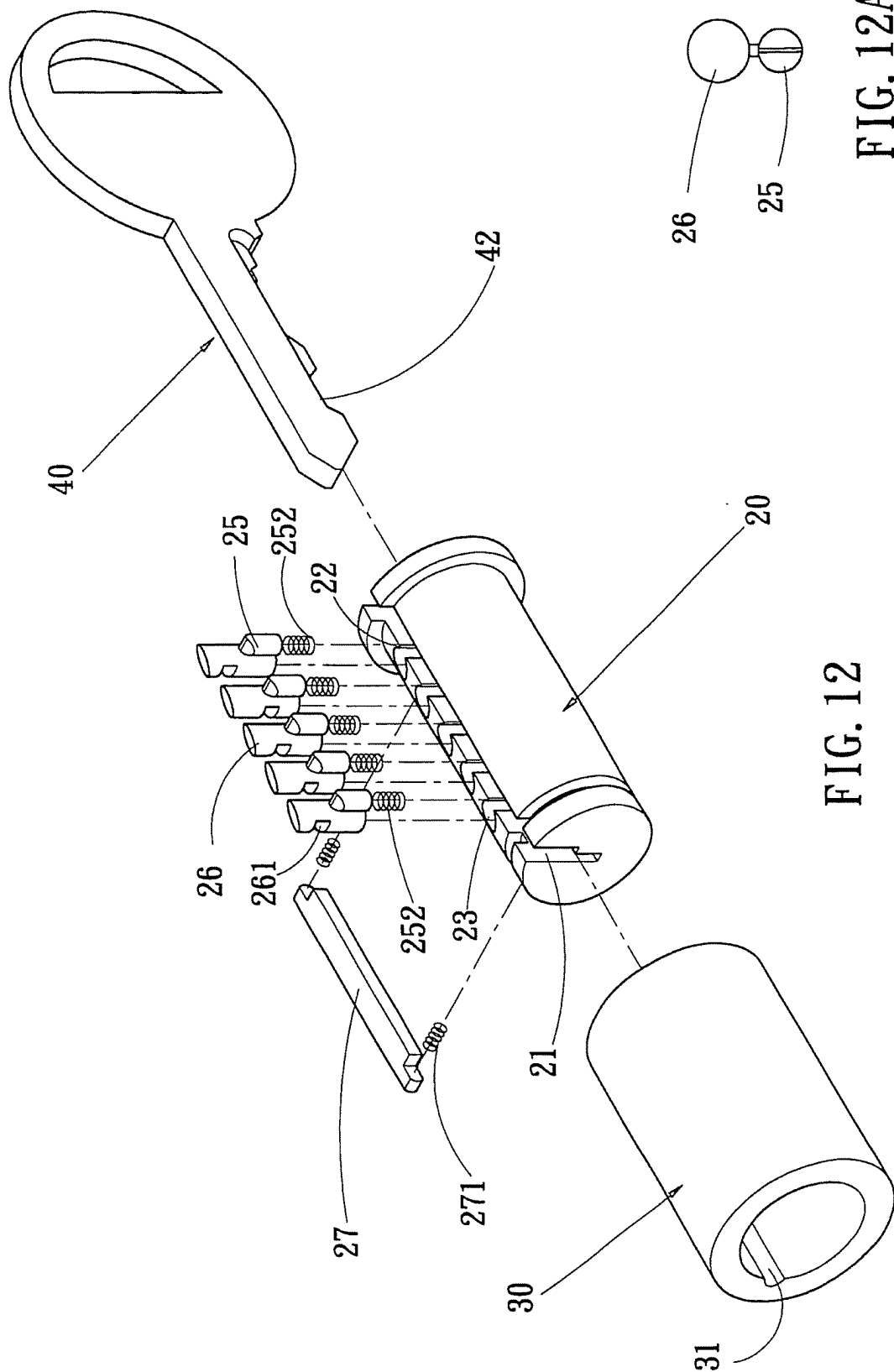
FIG. 10





C-C

FIG. 11



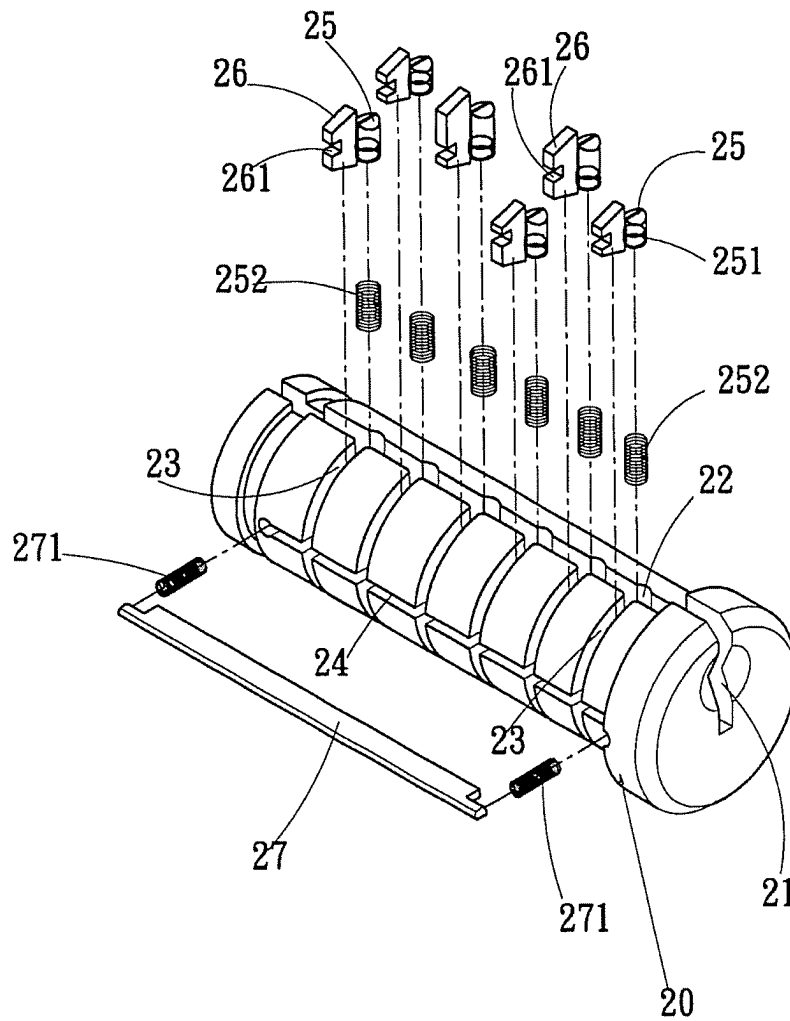


FIG. 13

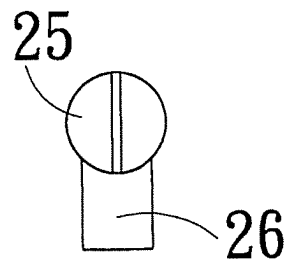


FIG. 13A

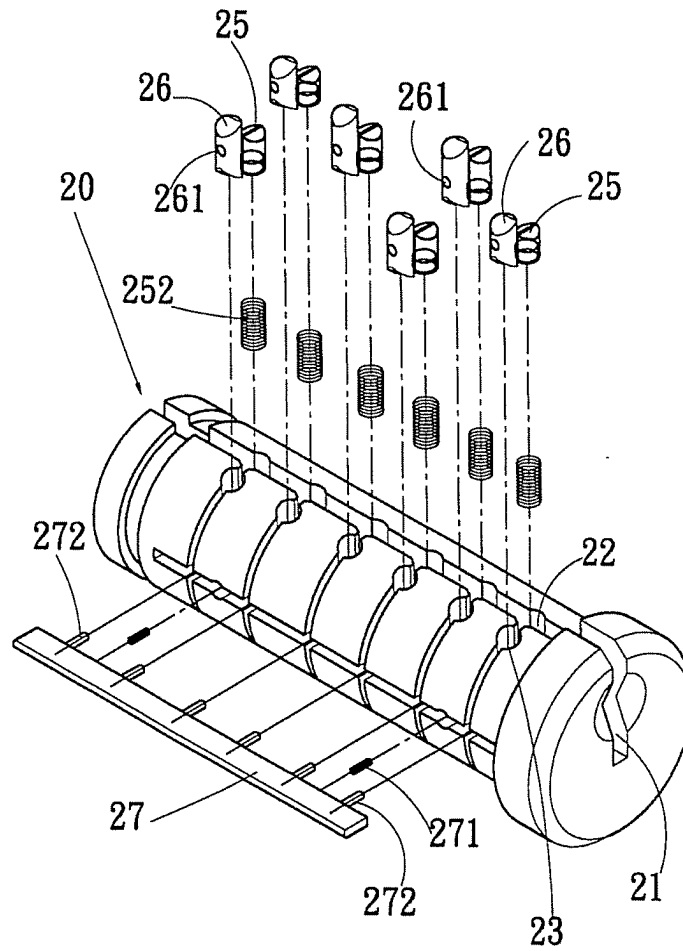


FIG. 14

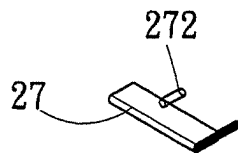


FIG. 14A

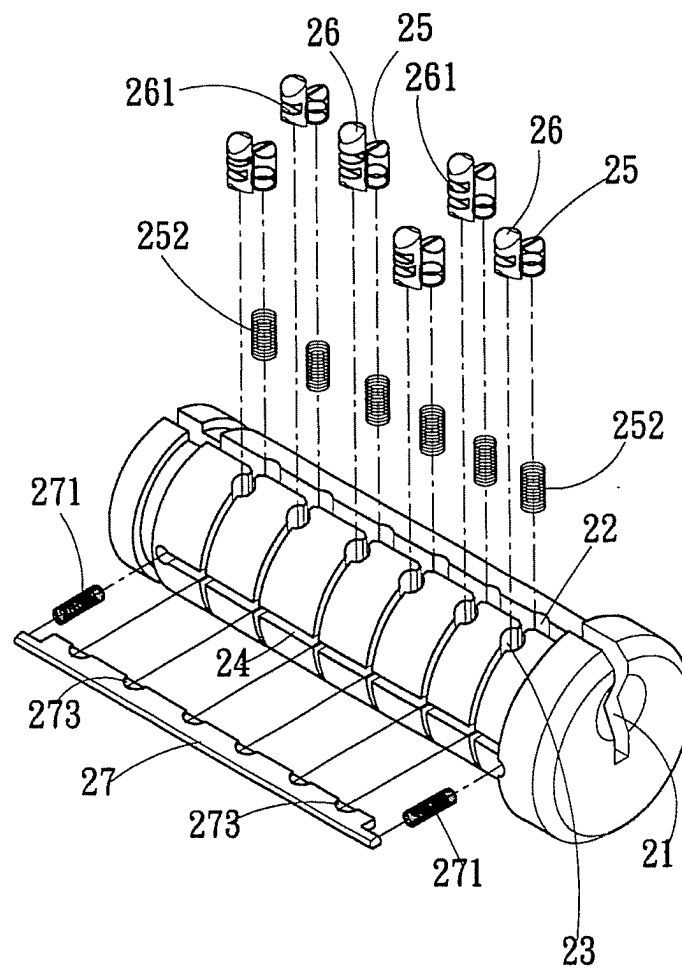


FIG. 15

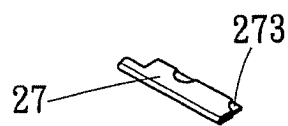
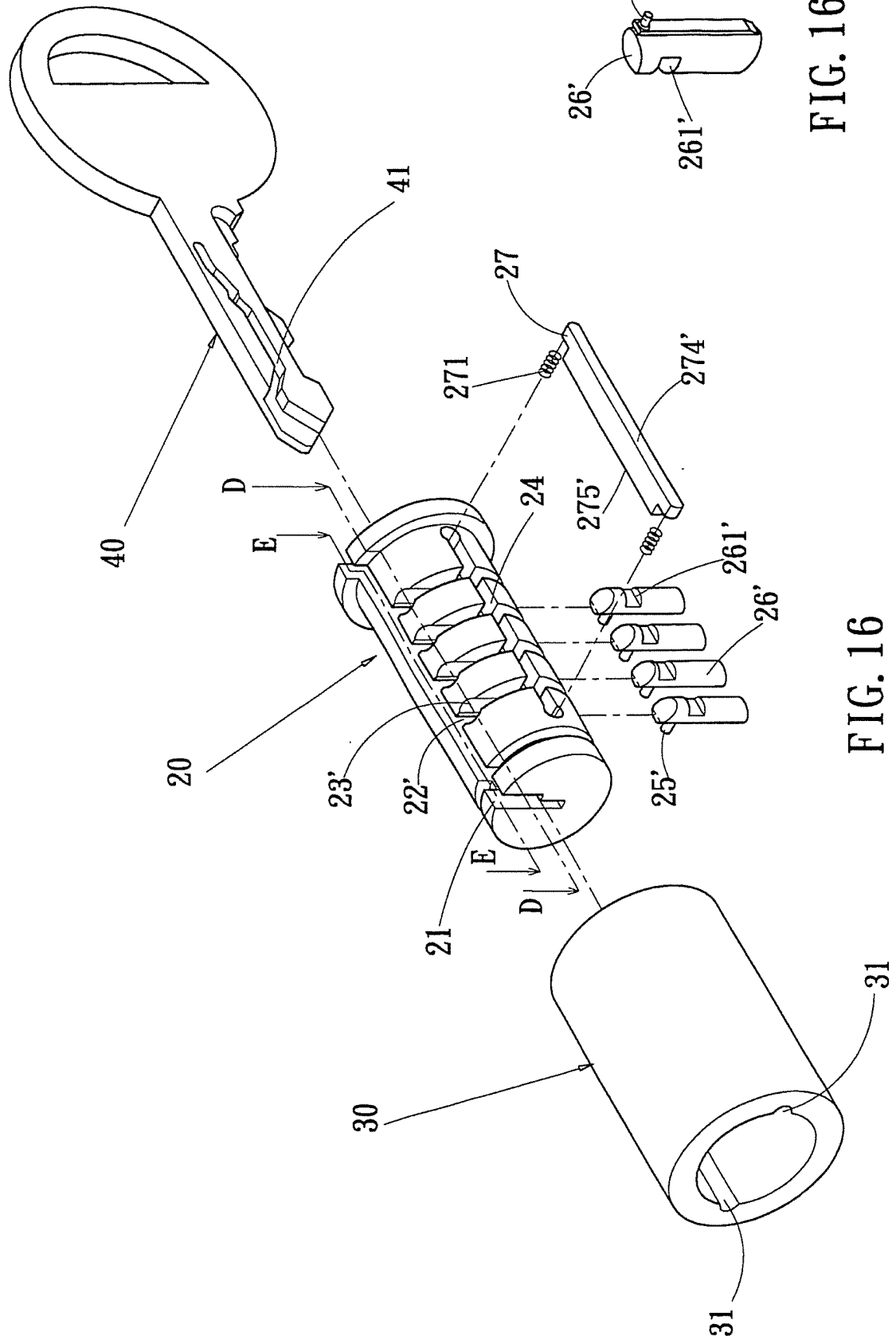


FIG. 15A

33 02 00 19413



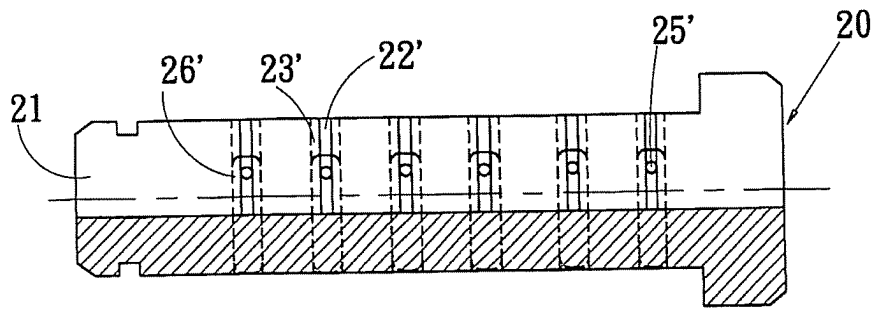


FIG. 17 E-E

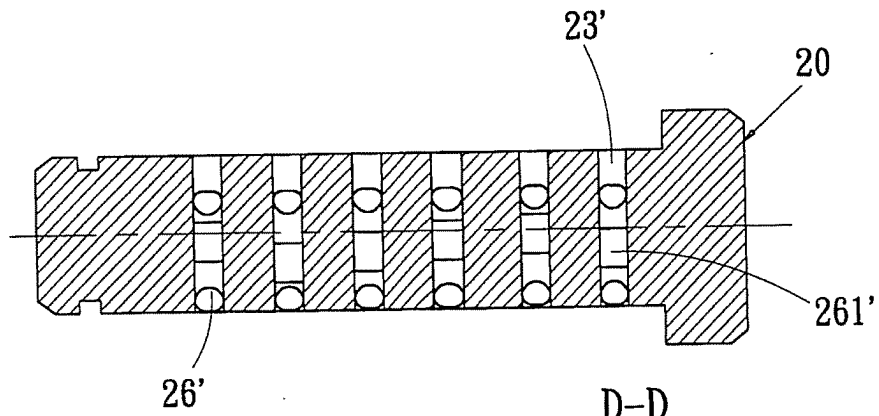


FIG. 18 D-D

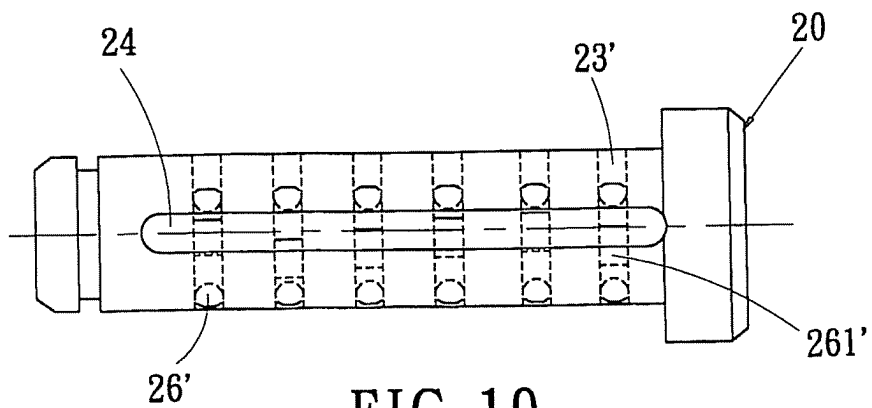
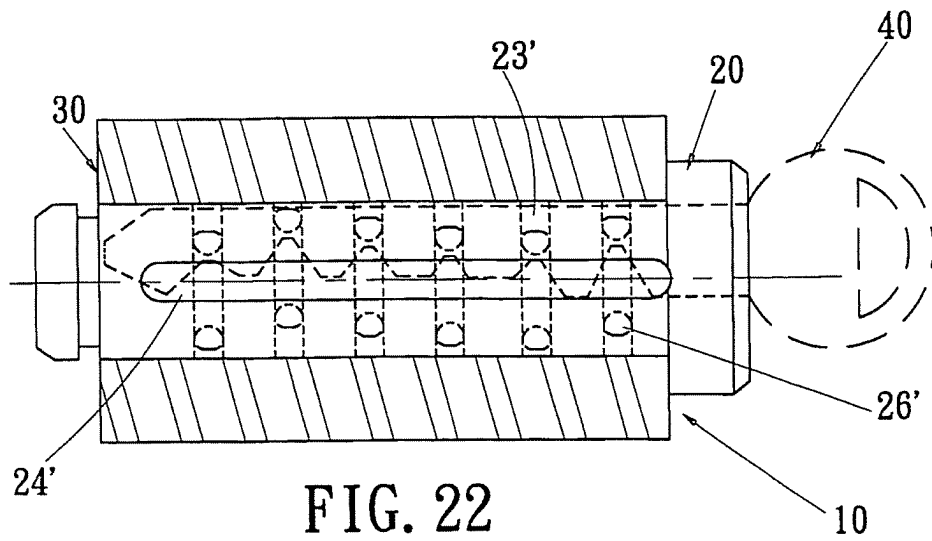
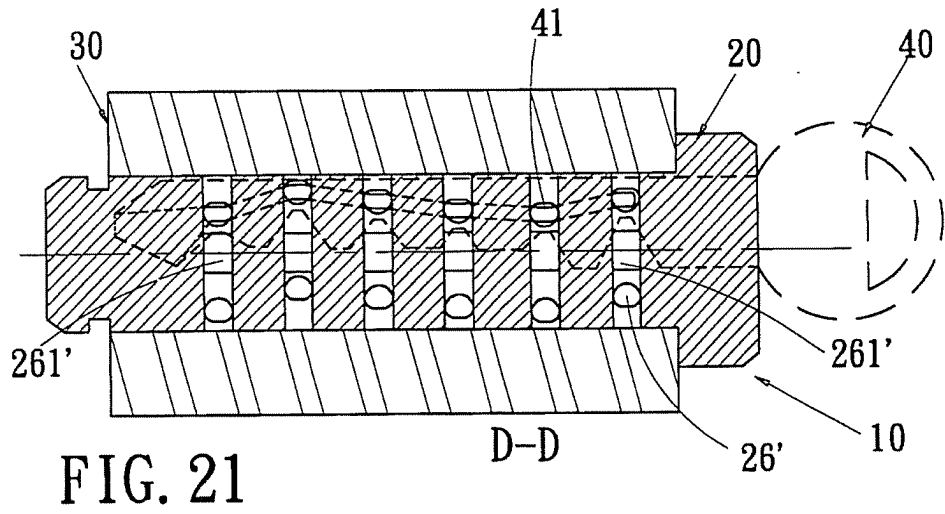
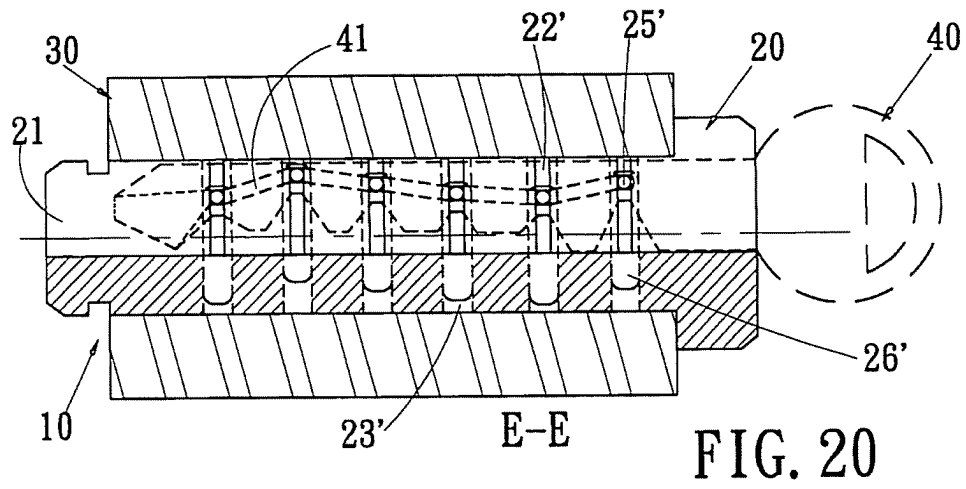


FIG. 19



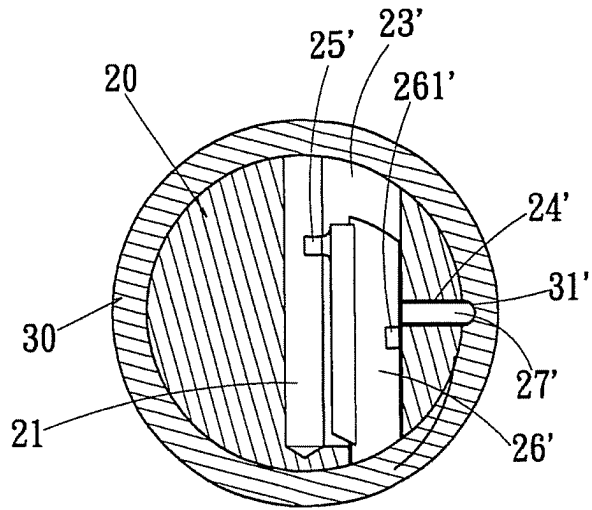


FIG. 23

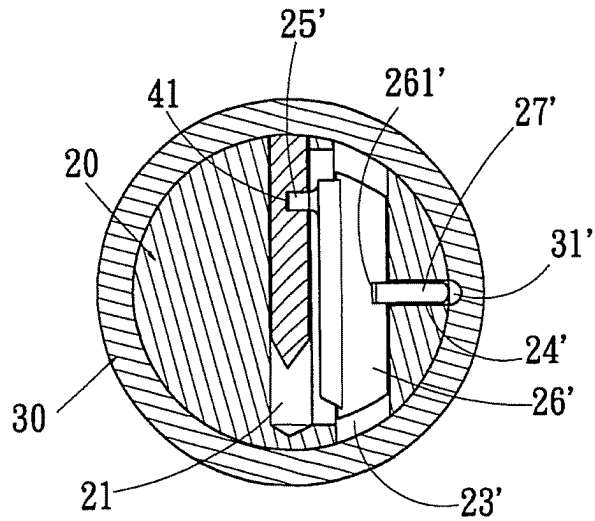


FIG. 24

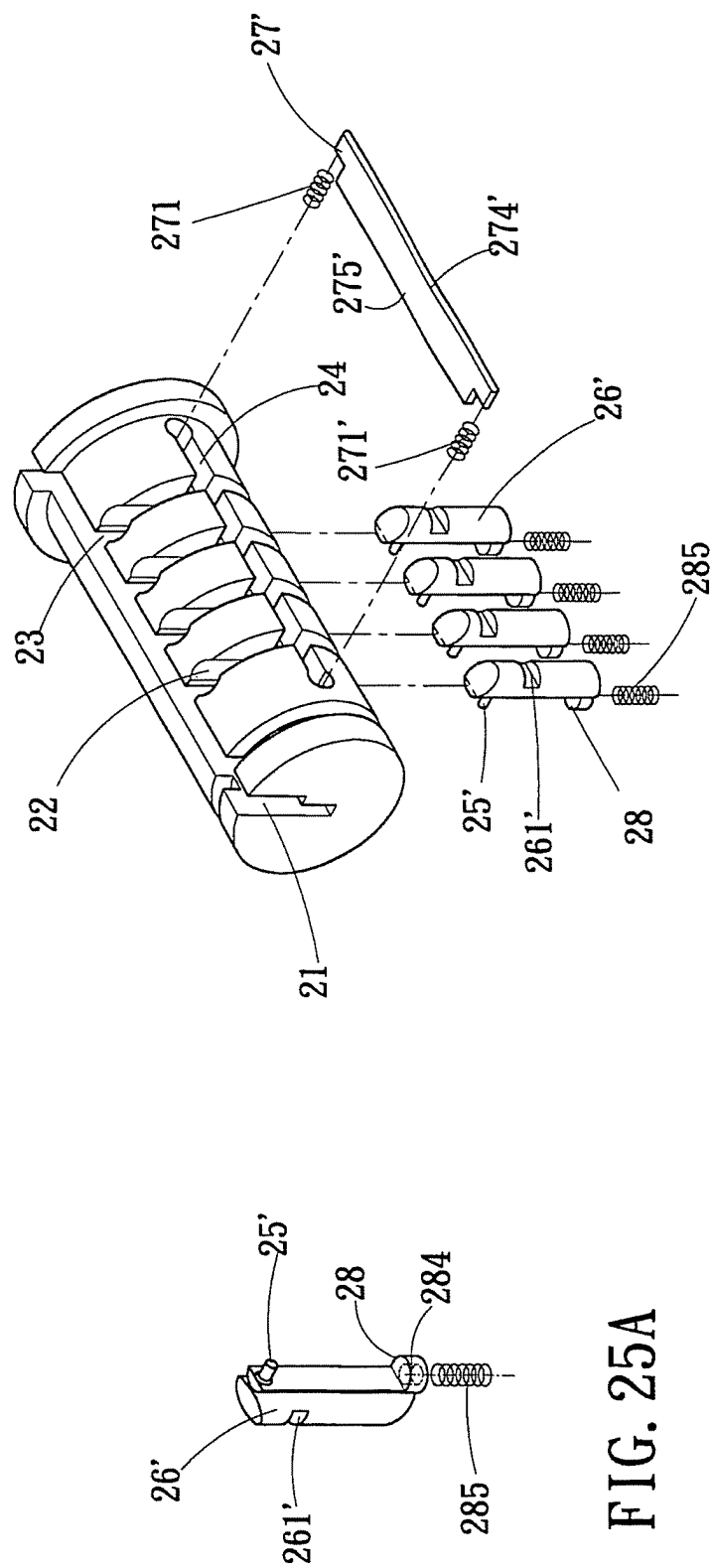


FIG. 25A

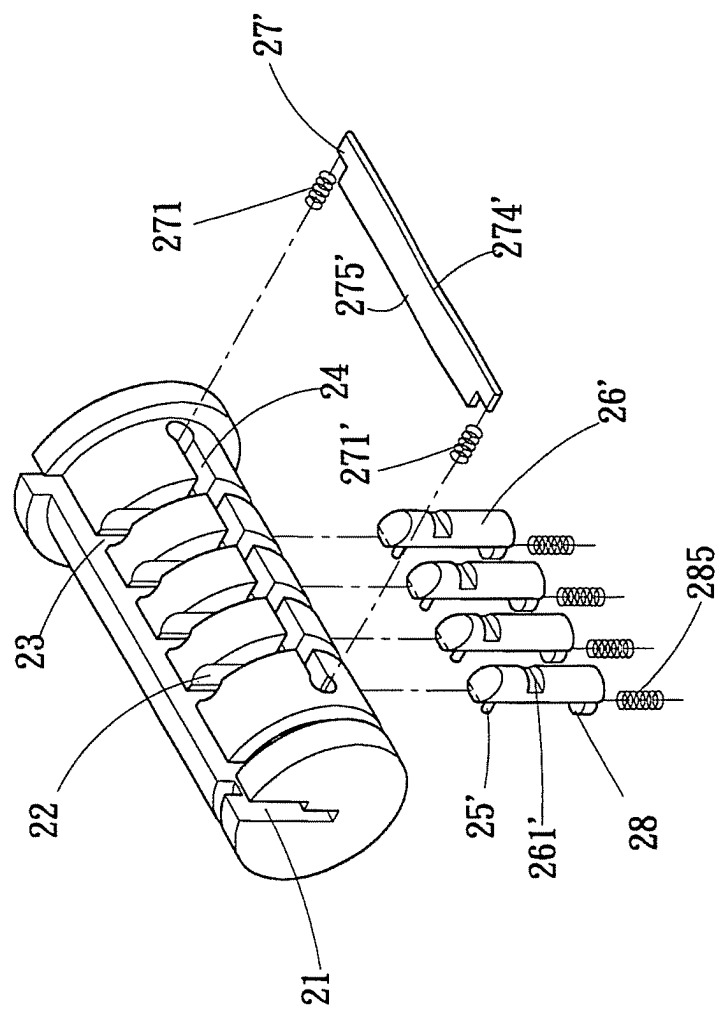


FIG. 25

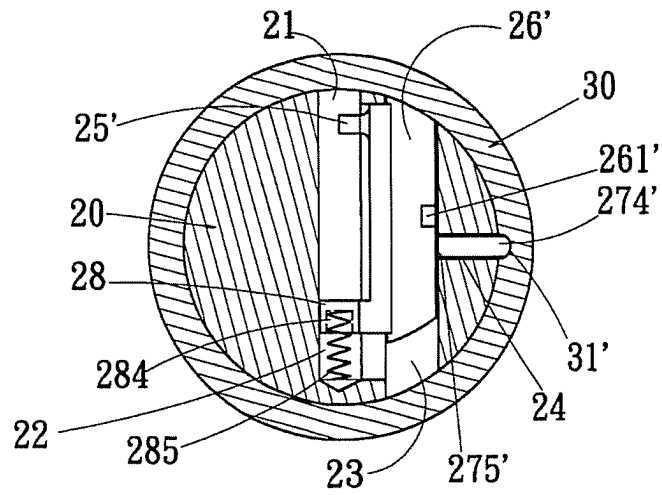


FIG. 26

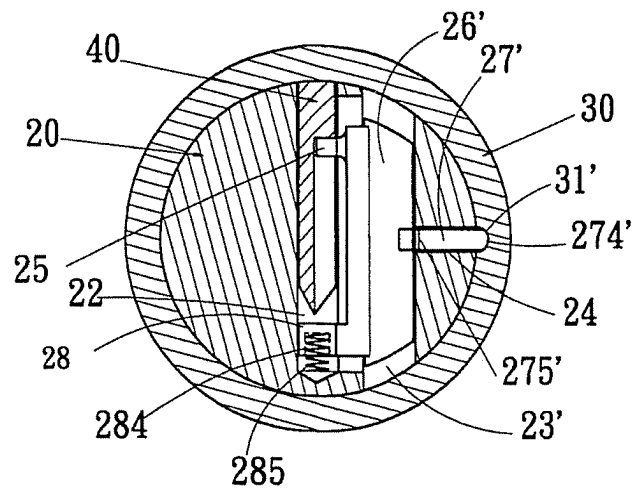


FIG. 27

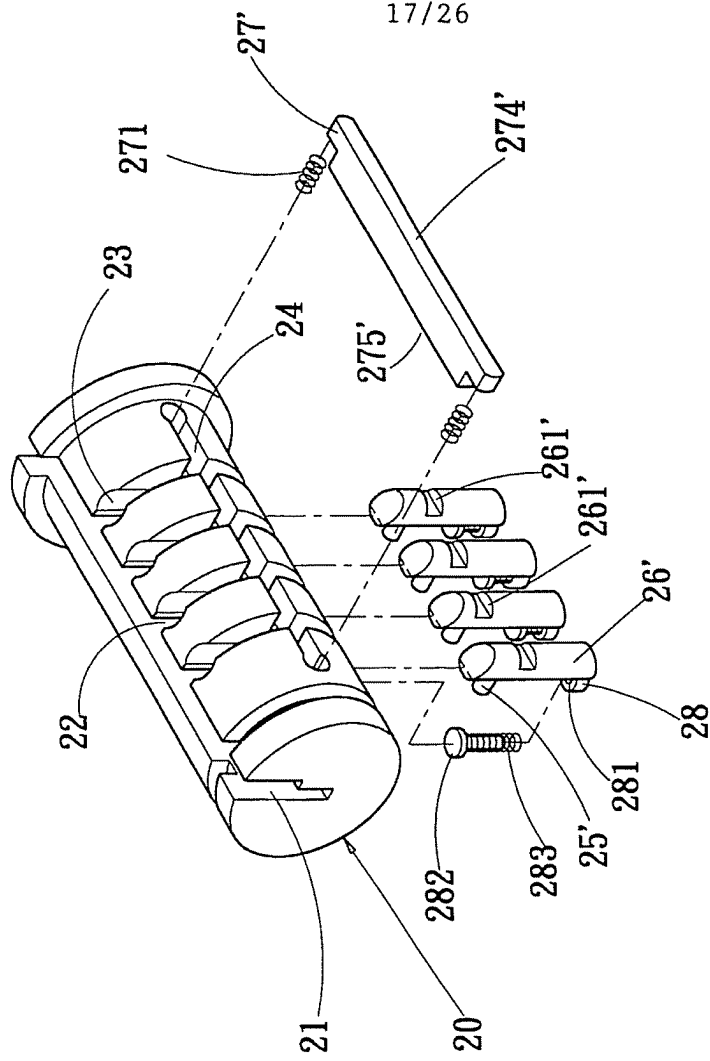


FIG. 28

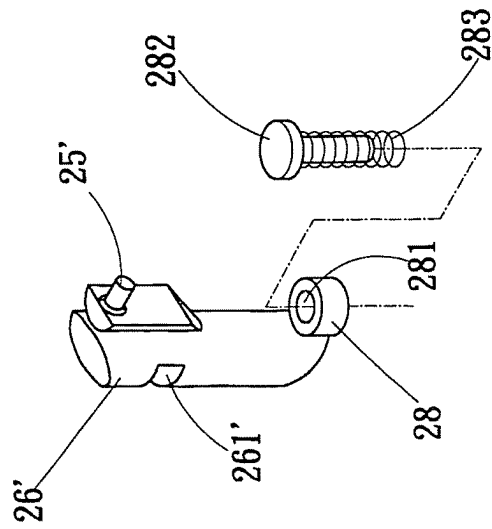


FIG. 28A

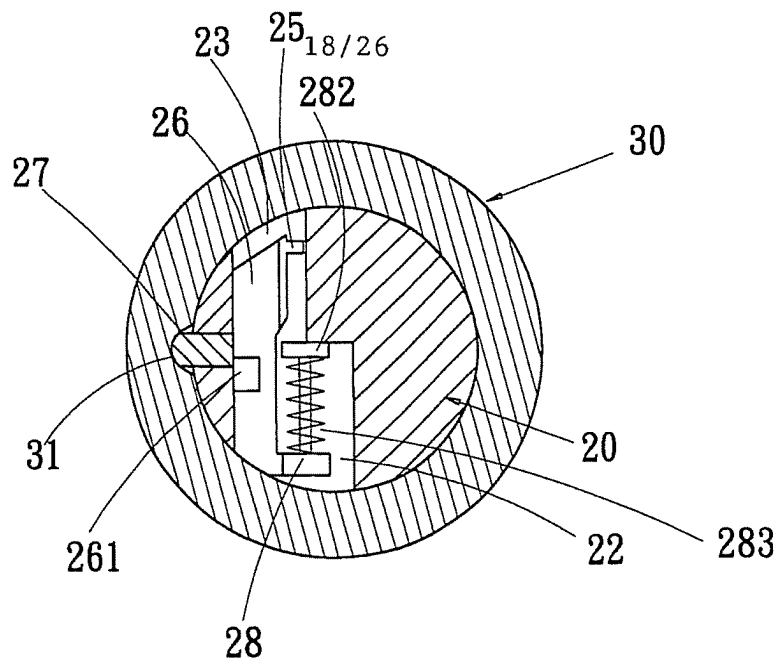


FIG. 29

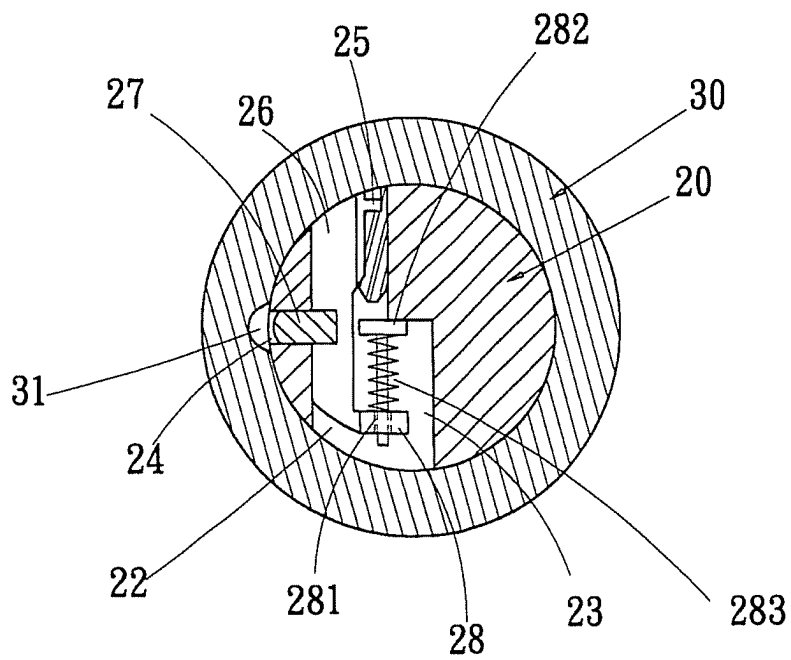
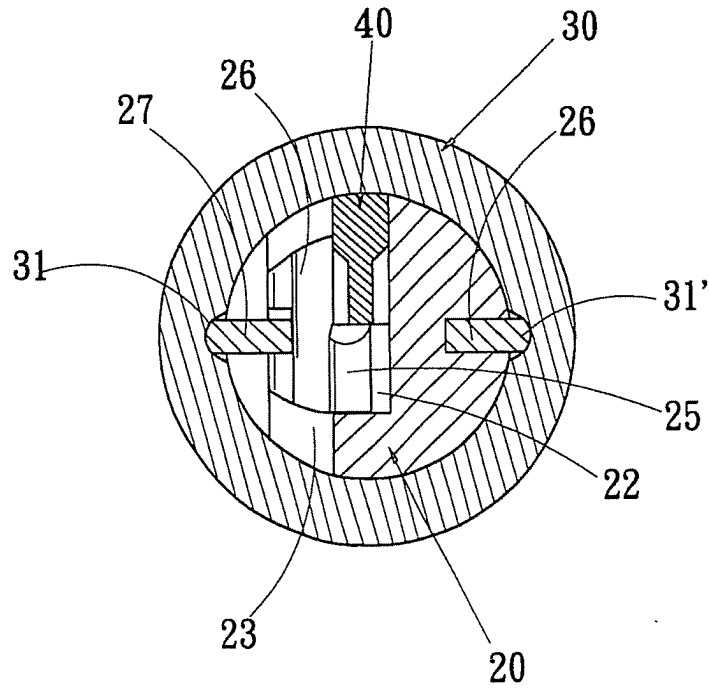


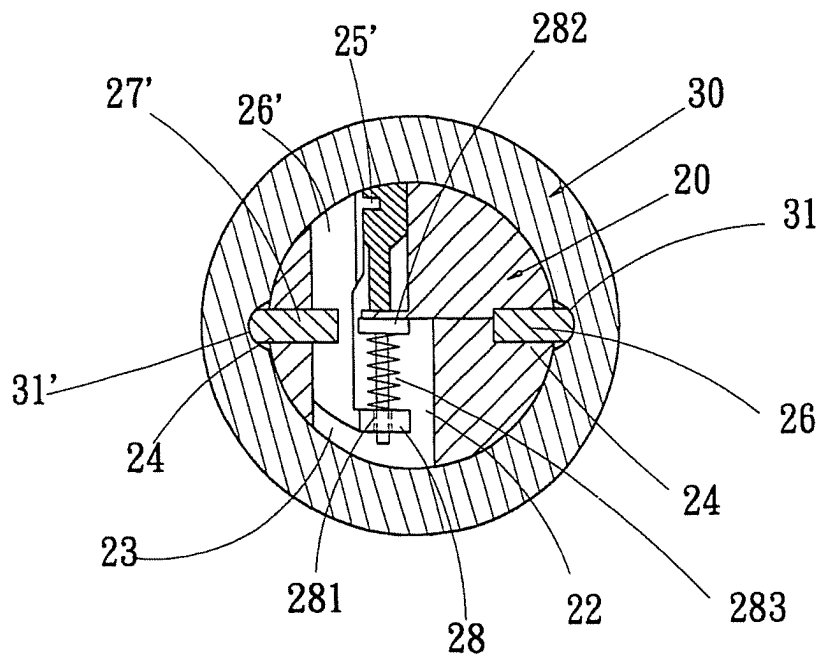
FIG. 30





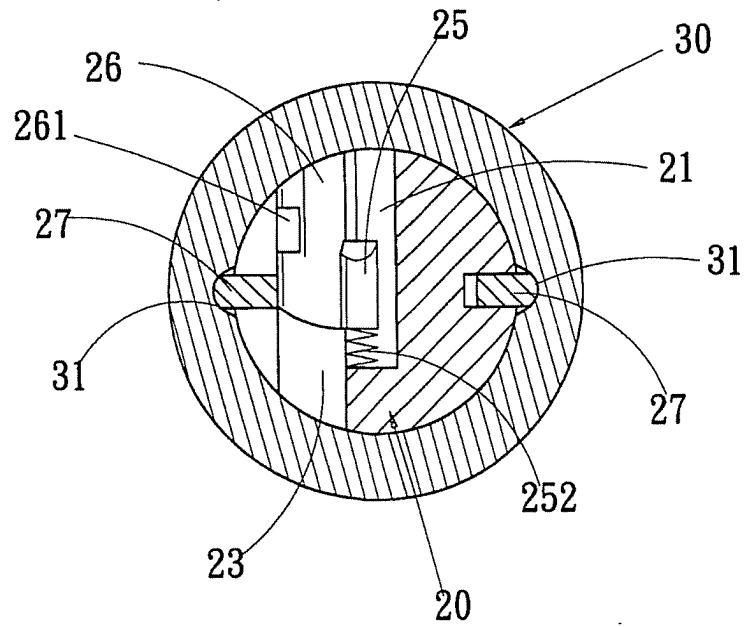
G-G

FIG. 32



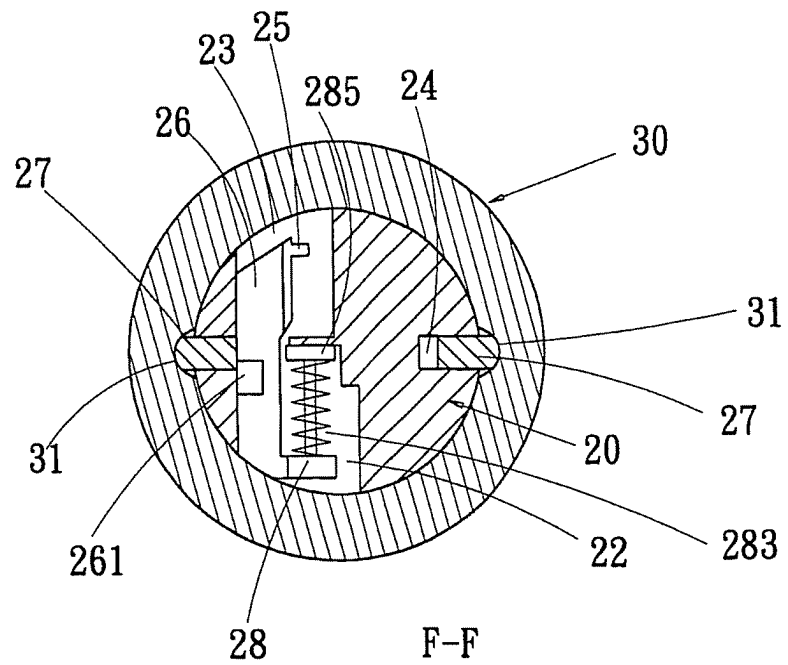
F-F

FIG. 33



G-G

FIG. 34



F-F

FIG. 35

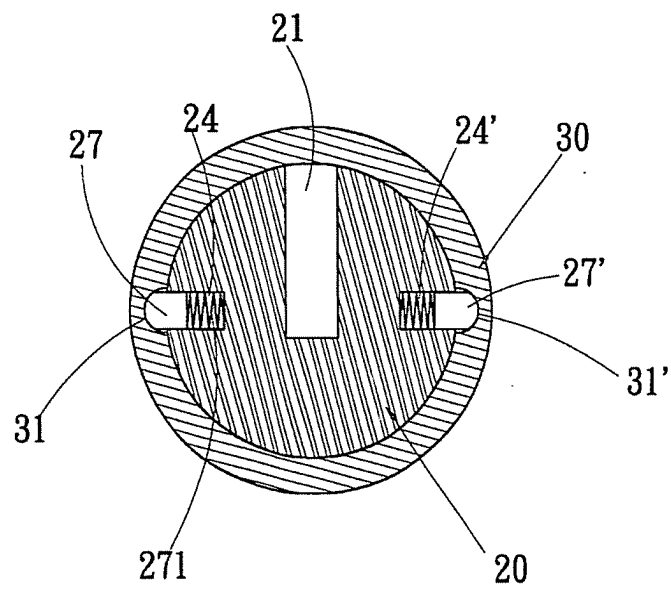


FIG. 36

33 32 31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1

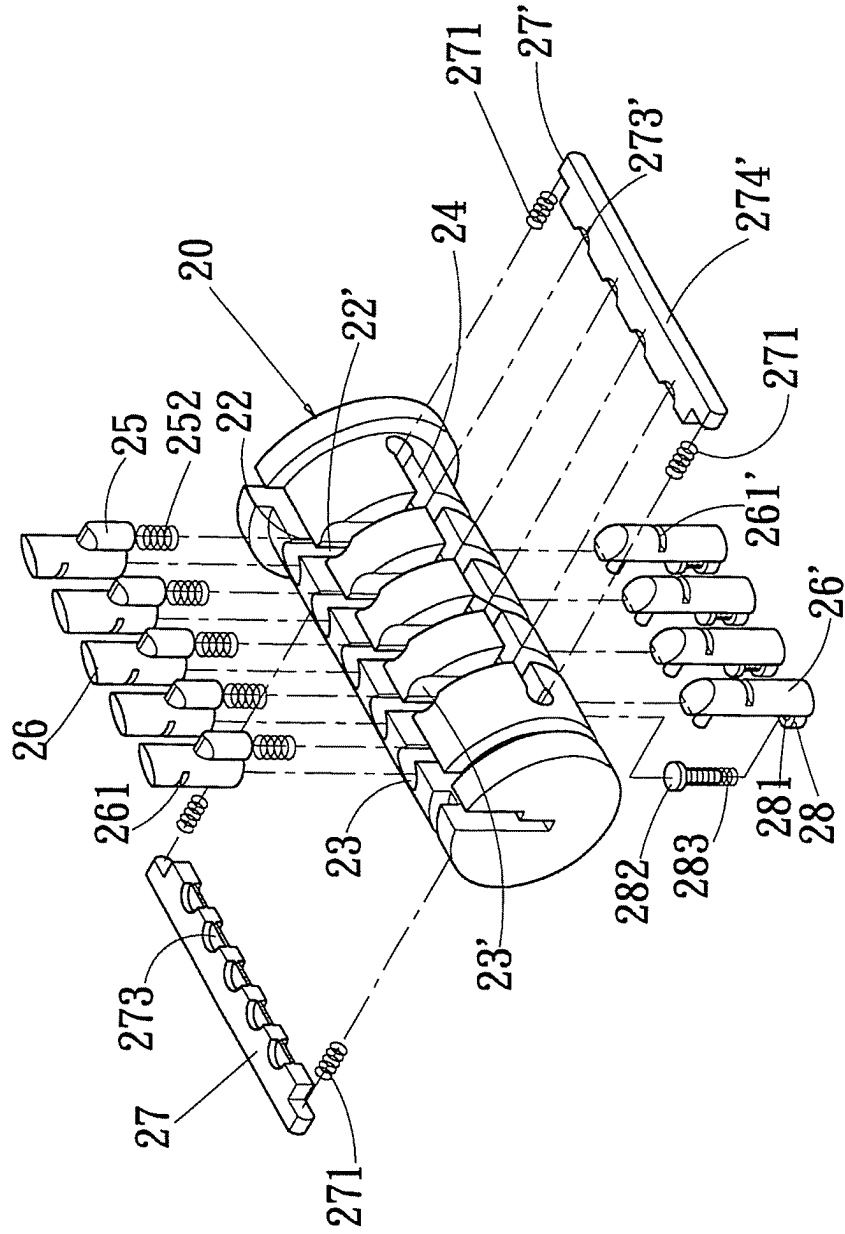


FIG. 38

23 02 00 19416

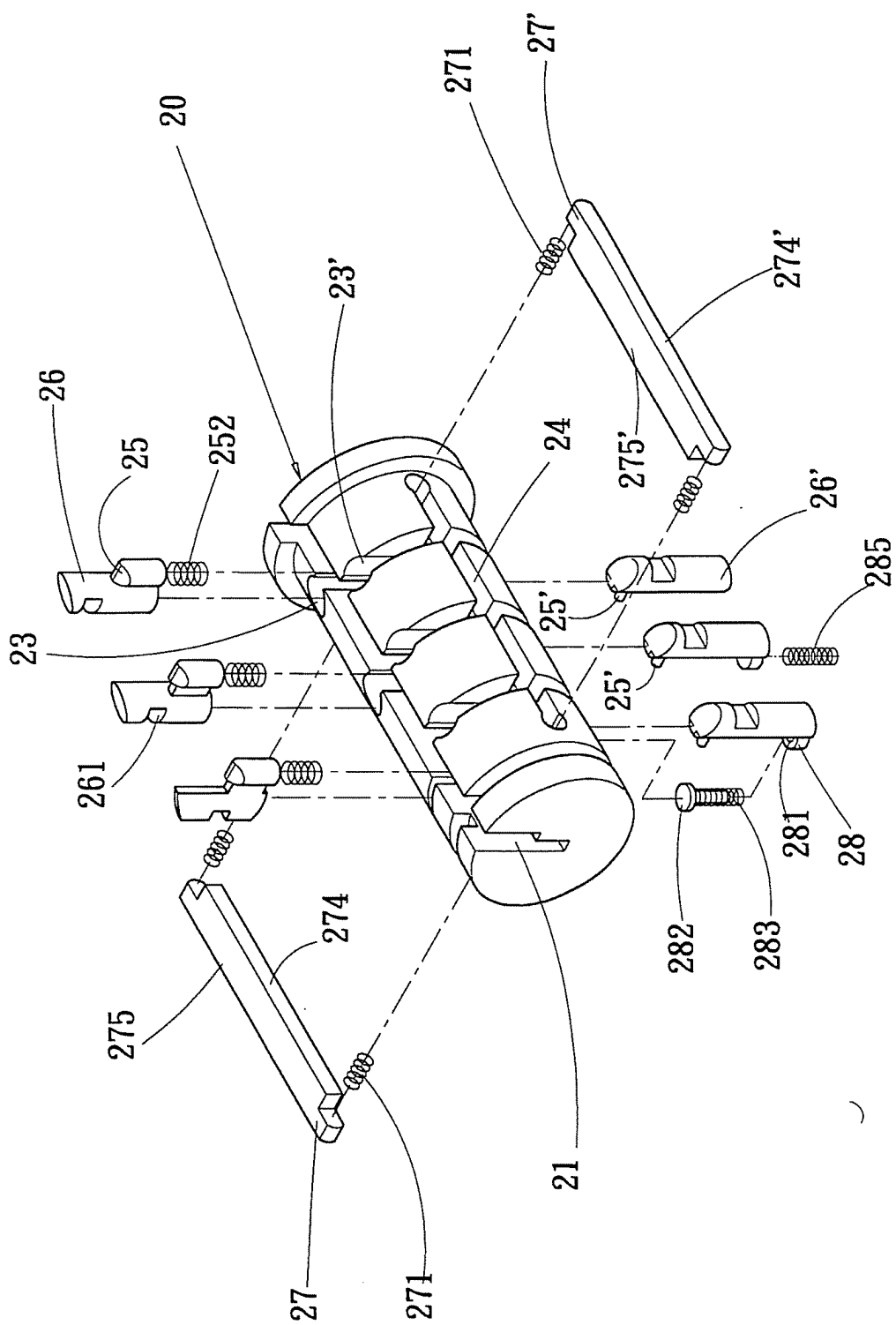


FIG. 39

FIG. 40

